**Supplemental Preliminary Amendment**
Applicant: Dennis J. Schloeman et al.
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Title: INTEGRATED PROGRAMMABLE FIRE PULSE GENERATOR FOR INKJET PRINTHEAD ASSEMBLY

## IN THE CLAIMS

No claims have been amended with the Supplemental Preliminary Amendment.

1. (Previously Presented) An inkjet printhead comprising:

nozzles;

firing resistors; and

fire pulse generator circuitry responsive to a start fire signal to generate a plurality of fire signals, each having a series of fire pulses, by controlling the initiation and duration of the fire pulses, wherein each fire pulse controls timing and activation of electrical current through selected firing resistors to thereby control ejection of ink drops from the nozzles.

2. (Original) The inkjet printhead of claim 1 wherein the fire pulse generator circuitry comprises:

pulse width registers for holding pulse width values, wherein the duration of the fire pulses is based on the pulse width values.

3. (Original) The inkjet printhead of claim 1 wherein the fire pulse generator circuitry comprises:

counters, each responsive to the initiation of a corresponding fire pulse to count to a corresponding count value representing the duration of the corresponding fire pulse.

4. (Original) The inkjet printhead of claim 3 wherein the fire pulse generator circuitry further comprises:

pulse width registers for holding pulse width values, wherein the counters are each preloaded with a corresponding pulse width value and respond to the initiation of the corresponding fire pulse to count down from the corresponding pulse width value to determine the duration of the corresponding fire pulse.

5. (Original) The inkjet printhead of claim 3 wherein the fire pulse generator circuitry further comprises:

controllers controlling corresponding counters, each controller providing a corresponding fire pulse and activating a start signal to the corresponding counter to initiate the count, and wherein each counter activates a stop signal to the corresponding controller to terminate the corresponding fire pulse when the count value is reached.

6. (Original) The inkjet printhead of claim 1 wherein the fire pulse generator circuitry comprises:

a start fire detection circuit receiving the start fire signal and verifying that a valid active start fire signal is received.

7. (Original) The inkjet printhead of claim 6 wherein the start fire detection circuit receives a clock signal having active transitions and verifies that the valid active start fire signal is received by requiring that the active start fire signal is present for at least two of the active transitions of the clock signal.

8. (Previously Presented) The inkjet printhead of claim 1 wherein an active start fire signal is provided to the fire pulse generator circuitry prior to each time a fire pulse is generated.

9. (Original) The inkjet printhead of claim 1 wherein an active start fire signal is provided to the fire pulse generator circuitry only at the beginning of a print swath.

10. (Original) The inkjet printhead of claim 1 wherein the fire pulse generator circuitry also controls dead-time between fire pulses in the series of fire pulses in each fire signal.

11. (Original) The inkjet printhead of claim 10 wherein the fire pulse generator circuitry comprises:

dead-time registers for holding dead-time values, wherein the dead-time between fire pulses is based on the dead-time values.

12. (Original) The inkjet printhead of claim 10 wherein the fire pulse generator circuitry comprises:

dead-time counters, each responsive to a termination of a corresponding fire pulse to count to a corresponding dead-time count value representing the duration of the dead-time between fire pulses.

13. (Original) The inkjet printhead of claim 12 wherein the fire pulse generator circuitry further comprises:

dead-time registers for holding dead-time values, wherein the dead-time counters are each preloaded with a corresponding dead-time value and respond to the termination of the corresponding fire pulse to count down from the corresponding dead-time value to determine the dead-time between fire pulses.

14. (Previously Presented) An inkjet printhead assembly comprising:

at least one printhead, each printhead including:

nozzles;

firing resistors; and

fire pulse generator circuitry responsive to a first start fire signal to generate a plurality of fire signals, each having a series of fire pulses, by controlling the initiation and duration of the fire pulses, wherein each fire pulse controls timing and activation of electrical current through selected firing resistors to thereby control ejection of ink drops from the nozzles.

15. (Original) The inkjet printhead assembly of claim 14, wherein the first start fire signal is provided from a printer controller located external from the inkjet printhead assembly.

16. (Original) The inkjet printhead assembly of claim 14 further comprising:

a carrier;

wherein the at least one printhead includes N printheads disposed on the carrier; and

a module manager disposed on the carrier and receiving a second start fire signal from a printer controller located external from the inkjet printhead assembly and providing the first start fire signal representing the first start signal to each of the N printheads.

17. (Original) The inkjet printhead assembly of claim 16 wherein the module manager is adapted to receive a serial input data stream and corresponding input clock signal from the printer controller located external from the inkjet printhead assembly and to demultiplex the serial data stream into N serial output data streams and to provide the N serial output data streams and N corresponding output clock signals based on the input clock signal to the N printheads.

18. (Original) The inkjet printhead assembly of claim 16, wherein the module manager is implemented in an integrated circuit.

19. (Previously Presented) An inkjet printhead assembly, comprising:

a carrier;

N printheads disposed on the carrier, each printhead including nozzles and firing resistors; and

a module manager disposed on the carrier and including:

fire pulse generator circuitry responsive to a start fire signal to generate a plurality of fire signals, each having a series of fire pulses, by controlling the initiation and duration of the fire pulses, wherein each fire pulse controls timing and activation of electrical current through selected firing resistors to thereby control ejection of ink drops from the nozzles of the printheads.

20. (Original) The inkjet printhead assembly of claim 19, wherein the start fire signal is provided from a printer controller located external from the inkjet printhead assembly.

21. (Original) The inkjet printhead assembly of claim 19 wherein the module manager is adapted to receive a serial input data stream and corresponding input clock signal from a printer controller located external from the inkjet printhead assembly and to demultiplex the serial data stream into N serial output data streams and to provide the N serial output data streams and N corresponding output clock signals based on the input clock signal to the N printheads.

22. (Previously Presented) The inkjet printhead assembly of claim 19, wherein the module manager is implemented in an integrated circuit.

23. (Previously Presented) An inkjet printhead assembly, comprising:
multiple inkjet printhead modules, each inkjet printhead module including:
a carrier;
N printheads disposed on the carrier, each printhead including nozzles firing and resistors; and
fire pulse generator circuitry responsive to a first start fire signal to generate a plurality of fire signals, each having a series of fire pulses, by controlling the initiation and duration of the fire pulses, wherein each fire pulse controls timing and activation of electrical current through selected firing resistors to thereby control ejection of ink drops from the nozzles.

24. (Original) The inkjet printhead assembly of claim 23 wherein the fire pulse generator circuitry is integrated into each printhead.

25. (Original) The inkjet printhead assembly of claim 23, wherein the each inkjet printhead module further includes:
a module manager disposed on the carrier and adapted to receive a serial input data stream and corresponding input clock signal from a printer controller located external from the inkjet printhead assembly and to demultiplex the serial data stream

into N serial output data streams and to provide the N serial output data streams and N corresponding output clock signals based on the input clock signal to the N printheads, and wherein the module manager includes the fire pulse generator circuitry.

26.-41. (Cancelled)

42. (Previously Presented) A fluid ejection device comprising:

nozzles;

firing resistors; and

fire pulse generator circuitry responsive to a start fire signal to generate a plurality of fire signals, each having a series of fire pulses, by controlling the initiation and duration of the fire pulses, wherein each fire pulse controls timing and activation of electrical current through selected firing resistors to thereby control ejection of fluid drops from the nozzles.

43. (Previously Presented) The fluid ejection device of claim 42 wherein the fire pulse generator circuitry comprises:

pulse width registers for holding pulse width values, wherein the duration of the fire pulses is based on the pulse width values.

44. (Previously Presented) The fluid ejection device of claim 42 wherein the fire pulse generator circuitry comprises:

counters, each responsive to the initiation of a corresponding fire pulse to count to a corresponding count value representing the duration of the corresponding fire pulse.

45. (Previously Presented) The fluid ejection device of claim 44 wherein the fire pulse generator circuitry further comprises:

pulse width registers for holding pulse width values, wherein the counters are each preloaded with a corresponding pulse width value and respond to the initiation of the

corresponding fire pulse to count down from the corresponding pulse width value to determine the duration of the corresponding fire pulse.

46. (Previously Presented) The fluid ejection device of claim 44 wherein the fire pulse generator circuitry further comprises:

controllers controlling corresponding counters, each controller providing a corresponding fire pulse and activating a start signal to the corresponding counter to initiate the count, and wherein each counter activates a stop signal to the corresponding controller to terminate the corresponding fire pulse when the count value is reached.

47. (Previously Presented) The fluid ejection device of claim 42 wherein the fire pulse generator circuitry comprises:

a start fire detection circuit receiving the start fire signal and verifying that a valid active start fire signal is received.

48. (Previously Presented) The fluid ejection device of claim 47 wherein the start fire detection circuit receives a clock signal having active transitions and verifies that the valid active start fire signal is received by requiring that the active start fire signal is present for at least two of the active transitions of the clock signal.

49. (Previously Presented) The fluid ejection device of claim 42 wherein an active start fire signal is provided to the fire pulse generator circuitry prior to each time a fire pulse is generated.

50. (Previously Presented) The fluid ejection device of claim 42 wherein an active start fire signal is provided to the fire pulse generator circuitry only at the beginning of a selected firing sequence.

51. (Previously Presented) The fluid ejection device of claim 42 wherein the fire pulse generator circuitry also controls dead-time between fire pulses in the series of fire pulses in each fire signal.

52. (Previously Presented) The fluid ejection device of claim 51 wherein the fire pulse generator circuitry comprises:

dead-time registers for holding dead-time values, wherein the dead-time between fire pulses is based on the dead-time values.

53. (Previously Presented) The fluid ejection device of claim 51 wherein the fire pulse generator circuitry comprises:

dead-time counters, each responsive to a termination of a corresponding fire pulse to count to a corresponding dead-time count value representing the duration of the dead-time between fire pulses.

54. (Previously Presented) The fluid ejection device of claim 53 wherein the fire pulse generator circuitry further comprises:

dead-time registers for holding dead-time values, wherein the dead-time counters are each preloaded with a corresponding dead-time value and respond to the termination of the corresponding fire pulse to count down from the corresponding dead-time value to determine the dead-time between fire pulses.